# *Monitoring for PCBs: a matter of detection*

- 209 distinct PCB Compounds – "Congeners"
- Total PCB (tPCB) = Summation of 209 Congeners
  - Basis for VA WQC = 1,700 picograms per liter (pg/L)
- Aroclors – a subset of congeners.
  - Aroclor 1248 is 48% chlorine
- Dielectric oils (transformer fluids) considered non PCB if < 50 ppm
  - Fish advisories at 0.05 ppm

- EPA Method 1668, Revision A
  - Non-Promulgated, performance based method
  - High Resolution GC/High Resolution MS
- Measures Total PCB - Congener-specific basis
  - Detection Level 5 pg/L (or 0.000005 ug/L)
  - Reporting Level 8-12 pg/L
- Used by DRBC for Delaware River TMDL
- Used for the Potomac River TMDL
- Used for the Levisa Fork TMDL
- Used for the Roanoke (Staunton) River TMDL
- Allows for detection of PCB levels un-detectable by former test methods.

- EPA Analytical Methods for PCBs (40 CFR Part 136)
- Method 608 and Method 625 – target Aroclors
  - Method 608
    - Permit reporting level = 500,000 – 1,000,000 pg/L
    - Detection level = 65,000 pg/L
  - Method 625
    - Reporting level = 50,000,000 pg/L
- TMDL and source tracking problem
  - Lacking ambient water and effluent PCB data at concentrations relevant to the WQC
  - Data deficiency require assumptions regarding loadings; or
- Solution
  - Utilize a method that can measure low level PCBs

| Prefix | Symbol | Multiplier | |
|---|---|---|---|
| exa | E | $10^{18}$ | 1,000,000,000,000,000,000 |
| peta | P | $10^{15}$ | 1,000,000,000,000,000 |
| tera | T | $10^{12}$ | 1,000,000,000,000 |
| giga | G | $10^{9}$ | 1,000,000,000 |
| mega | M | $10^{6}$ | 1,000,000 |
| kilo | k | $10^{3}$ | 1,000 |
| hecto | h | $10^{2}$ | 100 |
| deka | da | $10^{1}$ | 10 |
| deci | d | $10^{-1}$ | 0.1 |
| centi | c | $10^{-2}$ | 0.01 |
| milli | m | $10^{-3}$ | 0.001 |
| micro | $\mu$ | $10^{-6}$ | 0.000,001 |
| nano | n | $10^{-9}$ | 0.000,000,001 |
| pico<br>micromicro | p<br>$\mu\mu$ | $10^{-12}$ | 0.000,000,000,001 |
| femto | f | $10^{-15}$ | 0.000,000,000,000,001 |
| atto | a | $10^{-18}$ | 0.000,000,000,000,000,001 |